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Issued May 20, 1907.

United States Department of Agriculture,
BUREAU OF PLANT INDUSTRY,
Seed and Plant Introduction and Distribution.
WASHINGTON, D. C.

DISTRIBUTION OF COTTON SEED IN 1907.

The present will be the fifth distribution of cotton seed carried on by this office with the cooperation of Dr. Herbert J. Webber, of Plant Breeding Investigations.

During the past four years distribution has been made of twenty-seven varieties of cotton, every one of which was carefully selected by Doctor Webber and his assistants because of special local value.

From the reports so far received it is evident that as a rule the seed sent out by the Department of Agriculture was better than that commonly grown. The distribution of the present year will add five varieties to those previously distributed.

In general the Department will not duplicate the distribution of a variety, so that those who are pleased with the variety sent this year are urged to save their own seed.

LISLE MORRISON,
Assistant in Charge.

Approved:
B. T. GALLOWAY,
Chief of Bureau.

WASHINGTON, D. C., *April 2, 1907.*

29726—07 M——1

DISTRIBUTION OF COTTON SEED IN 1907.

PLAN OF DISTRIBUTING THE VARIETIES.

The Bureau of Plant Industry has in progress investigations in the improvement of cotton, and as a foundation for such work it is necessary to determine the varieties best suited to each section of the cotton belt. The distribution of cotton seed is therefore arranged with the view of furnishing growers with seed of new varieties to test in comparison with the varieties they already grow. This will enable them to make comparisons and select the varieties best suited to their climatic and soil conditions. Information regarding the adaptability of varieties to different sections is as yet too meager to enable a judgment to be formed as to which will succeed best in certain localities.

In the distribution of cotton seed it is proposed to select, so far as possible, new and little known varieties which have proved valuable in certain localities, and to distribute the seed in such a way as to insure their being generally tested throughout the cotton States. It is intended at the end of the season to follow up each package with a circular, in order to obtain information in regard to the results obtained. Growers receiving the seed are urged to cooperate with the Department of Agriculture by making a careful test of the seed which is sent with this circular. In another part of the circular will be found descriptions of the varieties distributed and a statement of the points on which information is desired.

The investigations of the Department have served to demonstrate that in many cases, if not the majority, cotton seed which is placed on the market as select seed has not been improved by any careful method of seed selection, but in general is simply select seed in the respect that it is taken from the first or second picking of seed, or possibly from a specially good field. It is of the greatest importance that highly selected pedigree seed which has been bred true to the type of the race and to a high state of productivity be placed in the hands of growers.

In order to demonstrate what can be accomplished by such selection the Department proposes to carefully and systematically select the seed of certain standard varieties in order to place in the hands of growers each year pedigree seed of high efficiency. In pursuance of this plan, seed of Pride of Georgia, Sunflower, and Southern Hope

cotton which have been subjected to some degree of selection are included in the distribution this year.

The Pride of Georgia cotton has been selected for four consecutive years, using careful pedigree methods, and the seed distributed should be of excellent grade. In the case of the Sunflower and Southern Hope varieties, however, selection has not yet been under way sufficiently long to have produced very marked effect, and the full results to be expected will not be visible in the seed distributed the present season. A statement as to the method used in selecting and growing the seed of these three varieties will be found in the description of the varieties in another part of this circular.

In this connection, the writer desires to urge growers to adopt some thorough and systematic method of selecting and improving their cotton seed, as it is just as important to plant good seed as it is to cultivate the crop. A paper describing the methods of selecting and breeding cotton will be sent to all farmers applying for it.

The small quantity of highly bred seed which can be distributed by the Department of Agriculture will only be sufficient to furnish a test of the variety. Growers are urged to use this seed as a basis to start pedigree selections for the purpose primarily of supplying improved select seed for their own plantations.

A special feature of interest in connection with the present seed distribution is the inclusion of the Columbia, a new variety of long-staple Upland cotton produced in the course of the breeding investigations of the Department. This variety is a big-bolled Upland type, similar to the Russell, except that it produces lint from $1\frac{5}{16}$ to $1\frac{3}{8}$ inches in length and of fine quality. Full details regarding the origin of the Columbia cotton will be given in the description of the variety.

In the boll-weevil-infested districts of Texas there is an urgent demand for big-bolled early varieties of cotton which will produce a good quality of lint. The early varieties, which have been mainly recommended for infested regions, such as King and Shine's Early, have proved unsatisfactory because of their poor, short lint and small bolls. Extensive variety tests have been conducted for the last two years in connection with the Plant Breeding Investigations of the Department, and these tests have resulted in calling attention to several little-known varieties which give promise of being valuable for general cultivation in boll-weevil districts. Seed of five such varieties (the Hagaman, Strickland, Triumph, Jackson Round-Boll, and Cook's Improved) have been distributed in previous years.

Last year for the first time seed was distributed of the new Edson cotton, an early big-boll sort, producing good lint. This year more highly selected seed of this variety is again included in the distri-

bution. The Edson cotton was produced through selection made from a native Texas sort by the late Mr. A. W. Edson, an investigator of the Bureau of Plant Industry. This variety has been fully selected by Dr. D. N. Shoemaker, and gives evidence of being a very desirable new sort.

For several years past Prof. D. A. Saunders, an agent of the Department of Agriculture, has been conducting careful selection experiments with the Triumph cotton, which is believed to be one of the best cottons to cultivate in the boll-weevil districts. A quantity of seed from this select strain is included in the present distribution. The seed of the Edson and of the select Triumph varieties was grown in the boll-weevil-infested section, and will not be distributed in regions where the weevil does not occur.

Considerable interest has been manifested by planters in eastern regions in testing the Triumph cotton, which has given such success in Texas. Heretofore the Department of Agriculture has been unable to procure any seed outside of boll-weevil districts, but this year a small quantity of seed, which is apparently the true Triumph, has been secured from Mississippi. This seed will allow the introduction and testing of the variety in eastern sections still free from weevil infection.

The other varieties selected for distribution the present season are Corley, Gold Standard, Shankhigh, and Toole. All of the varieties to be distributed are ordinary short-staple sorts except Columbia, Sunflower, and Southern Hope, which are classed as long-staple Uplands. No seed of Sea Island varieties has been included in the distribution the present season, owing to the fact that the Department has been unable to obtain good seed.

Distribution of Varieties, by States and Congressional Districts.

ALABAMA.

Districts 1 and 2	Shankhigh and Toole.
3 and 4	Toole and Corley.
5, 6, and 7	Shankhigh and Toole.
8 and 9	Corley and Shankhigh.

ARKANSAS.

Districts 1 and 2	Shankhigh and Corley.
3 and 4	Triumph (Mississippi-grown) and Shankhigh.
5, 6, and 7	Pride of Georgia and Toole.

FLORIDA.

District 1	Toole and Columbia.
2 and 3	Shankhigh and Toole.

GEORGIA.

Districts 1, 2, and 3	Pride of Georgia, Toole, and Shankhigh.
4, 5, and 6	Gold Standard and Shankhigh.
7, 8, and 9	Shankhigh and Columbia.
10 and 11	Corley and Toole.

LOUISIANA.

Districts 3 and 4	Triumph (Mississippi-grown) and Corley.
5, 6, and 7	Shankhigh and Corley.

MISSISSIPPI.

Districts 1, 2, 3, and 4	Shankhigh and Pride of Georgia.
5 and 6	Pride of Georgia and Corley.
7 and 8	Shankhigh.

NORTH CAROLINA.

Districts 1, 2, and 3	Toole and Shankhigh.
4, 5, and 6	Gold Standard and Toole.
7, 8, and 9	Toole, Pride of Georgia, and Shankhigh.

SOUTH CAROLINA.

Districts 1 and 2	Columbia and Gold Standard.
3 and 4	Shankhigh and Corley.
5, 6, and 7	Triumph (Mississippi-grown), Shankhigh, and Toole.

TENNESSEE.

Districts 3, 4, and 5	Pride of Georgia and Toole.
6 and 7	Gold Standard and Toole.
8 and 9	Shankhigh and Pride of Georgia.
10	Sunflower and Corley.

TEXAS.

Districts 1 and 2	Columbia and Pride of Georgia.
3, 4, and 5	Edson and Triumph (Texas-grown).
6	Gold Standard.
7, 8, and 9	Edson and Triumph (Texas-grown).
10	Toole.
11, 12, and 13	Edson and Triumph (Texas-grown).
14, 15, and 16	Edson and Triumph (Texas-grown).

OKLAHOMA.

Entire Territory	Pride of Georgia and Toole.

DESCRIPTION OF VARIETIES DISTRIBUTED.

Short-Staple Upland Varieties

PRIDE OF GEORGIA.

(Distribution arranged by H. J. Webber.)

Pride of Georgia (fig. 1) is a big-bolled upland cotton, originated by James F. Jones, near Hogansville, Troup County, Ga., about 1901. It was produced by selecting especially fine early stalks from the Jones Improved cotton, the first selection being made in 1900. The seed was carefully selected again in 1901 and 1902. The variety is described by Mr. Jones as similar to the original Jones Improved, but inclined to fruit and mature earlier.

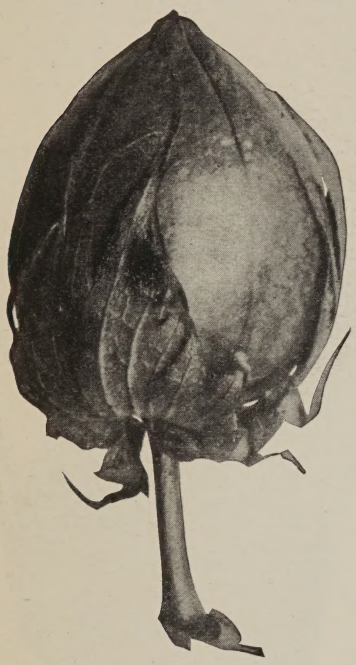

FIG. 1.—Mature boll of Pride of Georgia cotton.

A variety plat of the Pride of Georgia cotton from select seed purchased from Mr. Jones was grown at Columbia, S. C., in 1903, and in the course of the experiments conducted by the Department of Agriculture it was found to be one of the best varieties tested. In considering all characters it was thought to be the best early big-bolled race tested, and, accordingly, a number of selections were carefully made of the best-producing early plants. These were planted in a breeding patch in 1904, the progeny of each selected individual being planted separately. Individual selections were made from the best progenies of these, which were again planted, in 1905, in a special breeding patch. After the individual selections were removed from the breeding patch of 1905, the remaining portion of the breeding patch was retained for planting a multiplication plat in 1906, following out the method of seed selection pursued by the best plant breeders.

It is the seed from this multiplication plat which is being distributed in 1907. The seed is thus more carefully selected than that usually placed in the hands of growers and should give good results. The breeding of this variety for higher production is being continued by the best improved methods, and each year seed of a higher degree of perfection will be furnished for the Department's distribution. It is certainly one of the earliest and most prolific of

the big-bolled cottons and is especially adapted to the cotton sections of Georgia and South Carolina. Its adaptability to central and western sections of the cotton belt has not been thoroughly determined.

A short description of the race follows:

Plant low, stocky, vigorous, and prolific, of Truitt type, with two to four wide-spreading horizontal branches from near the base; bolls round to ovate, very large, 5 locked; seeds tawny, fuzzy, or tufted, medium size, well covered with lint, 8 to 9 per lock; staple 1 inch in length, white, very strong, good in uniformity, and of medium fineness; per cent of lint, 32 to 34; season of maturity early.

The seed of this variety distributed was grown by Mr. R. C. Keenan, of Columbia, S. C., under the immediate direction of the Department of Agriculture.

EDSON COTTON.

(Distribution arranged by D. N. Shoemaker.)

The seed of the Edson cotton (fig. 2) sent out this season is a further selection of the variety distributed under the same name last year. The late Mr. A. W. Edson, an investigator in the Department of Agriculture, began his selection with a variety locally known about Calvert, Tex., as the Hugh Daly cotton. In the autumn of 1903 he carefully selected about fifty of the most desirable plants from a field of this cotton, keeping in mind size of boll and length of lint, but selecting mainly for earliness. The seed from these plants was planted separately at Waco, Tex., in 1904. In the picking season it was found that one number was markedly in advance of the others in the breeding plat in earliness. This row, from plant No. 40, was again selected and all the seed sent out this year under this name is the product of this one row. It is quite a step in advance of last year's Edson, but differs from it mainly in earliness. The gin turn-out gives from 32 to 34 per cent of lint. It is fairly stormproof, and there is some complaint that it is difficult to pick, but it com-

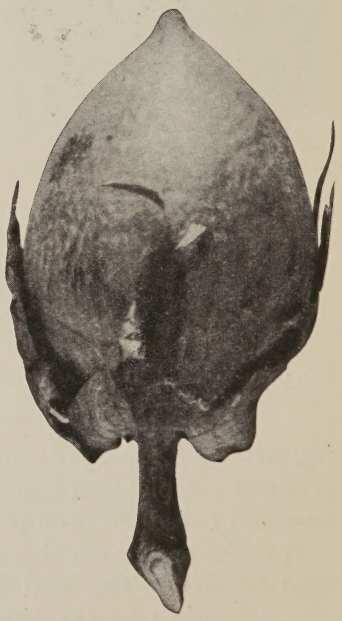

FIG. 2.—Mature boll of Edson cotton.

bines the desirable qualities of good length of lint and large boll with very decided earliness. It is one of two varieties offered this year which have been bred for boll-weevil-infested regions.

Plant vigorous, of moderate growth, wide branching and with few to several ascending basal branches; bolls medium to large, about 70 to the pound of seed cotton; locks 8 seeded; lint of Upland character, fairly abundant, 1 to 1⅛ inches in length; seeds large, fuzzy, white; season early.

The seed used for this distribution was grown at Waco, Tex., in the season of 1906 by Mr. T. O. Plunkett under the direction of the Cotton Laboratory of the Plant Breeding Investigations of the Department of Agriculture.

GOLD STANDARD.

(Distribution arranged by E. B. Boykin.)

Gold Standard cotton (fig. 3) is an Upland, short-staple variety which was originated by Mr. C. F. Moore, of Cheraw, S. C. In regard to its origin, Mr. Moore states that while making selections of Excelsior Prolific cotton his attention was attracted to a single plant which was strikingly superior to any other plant in the field. The bolls on this plant were large and set thick and close on the limbs, and the plant was symmetrical in general appearance. This plant was picked and planted by itself the following year, and the progeny gave encouragement for further selections which have been made since by the originator. From the fact that many of the seeds were of a brownish or yellowish color, the name Gold Standard was suggested. In time of maturity, general type of plant, and size and shape of bolls the variety is very similar to the Excelsior cotton.

FIG. 3.—Mature boll of Gold Standard cotton.

Plant vigorous, of the branching, thin-foliaged type; bolls of medium size, round, rather pointed, and from 4 to 5 locked; seed small, brownish or yellowish tufted, per cent of lint about 35, in character like that of ordinary Upland, averaging about 1 inch in length.

The seed of this variety which is being distributed this season was obtained from Mr. C. F. Moore, the originator, and was grown at Cheraw, S. C., in 1906.

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SHANKHIGH.

(Distribution arranged by H. J. Webber.)

In traveling through northern central Georgia the past season, the writer's attention was drawn to a new type of cotton—the Shankhigh (fig. 4)—which has been gaining in favor since its introduction about three years ago and has come to be quite generally cultivated in the vicinity of Bishop, Machen, and Eatonton, Ga. According to the statement of Mr. M. L. Branch, the originator of the variety, it was produced by the selection of a single stalk of cotton found growing in a field of Russell Big-Boll cotton. This stalk, being of excellent character and differing in habit from the surrounding plants, was picked and ginned by hand and planted the next year in a plat by itself. From this one selection the variety, which is very marked in character, apparently developed. Mr. Branch makes the following statement regarding the variety:

> It comes up with a long shank and it grows taller than other cottons. It is easier to pick, and I think it will make more with extra preparation than other sorts. I have heard of some growers on very fertile lots making as much as three bales per acre.

FIG. 4.—Mature boll of Shankhigh cotton.

The writer examined a number of fields of the Shankhigh variety and was much pleased with it. The growers invariably state that when the plants are young they are tall and slender and very unpromising in appearance, but they are very fruitful and prove very satisfactory at the end of the season. The best recommendation for the variety which can be made is the fact that every grower of this cotton interviewed stated that he intended to increase his planting the next season.

The plant of the Shankhigh cotton (fig. 5) grows tall and erect, and produces its main crop well above the ground, where it is easy to pick, as the picker is not required to stoop over to any extent, but can usually stand nearly or quite erect. The variety may not prove valuable for other sections, but its local success justifies its careful trial in other localities.

Plant vigorous, tall, and erect, semicluster type; basal branches usually 2 to 3, starting about 1 foot from the ground and growing erect and close to the

FIG. 5.—Plant of Shankhigh cotton, showing form of branching.

main stem; main stem well set with stiff short-jointed branchlets; bolls erect, ovate, blunt pointed, medium to large in size, 5 locked, opening well; seeds well covered, medium in size, white, fuzzy, 8 to 9 per lock; lint white, uniform in length, strong, averaging 1 inch in length, of ordinary Upland character; per cent of lint 35 to 38; season of maturing medium.

The seed of this variety distributed by the Department of Agriculture was grown by R. E. Branch, of Bishop, Ga., and Bullard Brothers, of Machen, Ga., in the season of 1906.

TOOLE.

(Distribution arranged by E. B. Boykin.)

The Toole cotton (fig. 6) was originated by Mr. W. W. Toole, of Augusta, Ga., from a single plant found on his plantation about twelve years ago. Mr. Toole was growing Peterkin cot-

ton at that time. His attention was attracted to the original plant by its short joints and numerous bolls. Since its origin the variety has been grown and kept pure, and considerable attention has been given to its improvement by constant selection.

The bolls are small, but open well and are easily picked. The variety appears to be nearly as early as the King cotton and quite as productive, if not more so. It is fairly nondropping or resistant to storms, being considerably better than the King variety in this respect. In length of staple the variety is somewhat variable, ranging from $\frac{3}{4}$ inch to $1\frac{1}{8}$ inches, and possibly averaging about 1 inch. The foliage is thin and open, permitting the sun to shine through the plant.

It is claimed by Mr. Toole that seed cotton will yield from 40 to 44 per cent of lint. This character, together with the short joints and excellent yielding qualities, makes it a very desirable variety for upland conditions.

Plant medium large, erect, vigorous, with numerous horizontal branches, short joints; bolls ovate, small, 4 to 5 locked, easily picked; staple $\frac{3}{4}$ inch to $1\frac{1}{8}$ inches in length; per cent of lint from 35 to 42; season of maturity early.

FIG. 6.—Mature boll of Toole cotton.

The seed of Toole cotton distributed by the Department of Agriculture was furnished by Mr. W. W. Toole, of Augusta, Ga., the originator, and was grown in the season of 1906.

TRIUMPH.

(Distribution arranged by D. A. Saunders and E. B. Boykin.)

The variety known as Triumph (fig. 7) was originated by Mr. A. D. Mebane, of Lockhart, Tex., who developed it from a single plant found in his general crop in 1899, and it is supposed to be an accidental cross between Texas Stormproof and Peterkin cottons. It has the stock, boll, and nondropping character of the Stormproof variety, but has a much higher percentage of lint, in this respect resembling the Peterkin cotton. The seeds also are often smooth and black like those of the Peterkin variety, while those of the Stormproof are fuzzy or tufted.

The valuable qualities of the variety are its nondropping, stormproof character and its high percentage of lint. The large 5-locked bolls hold the seed cotton well all through the autumn, despite winds

and rains, and they are very easily picked. This stormproof character is attributed largely to the long, slender stems which support the bolls (fig. 7). In case of continued rain these stems become soft and are easily bent. Meantime the bolls, which are naturally large and heavy, absorb water and become so heavy that the stems are unable to hold them in an erect position and bend, inverting the bolls and causing them to point downward. In this position the burs and bracts form a very complete covering for the cotton, thus keeping it comparatively dry and protecting it from serious damage in case of unfavorable weather.

The importance of this character was strongly emphasized during the rain storm which occurred in the Delta region of Mississippi in September, 1906. It rained in that section for about twelve days. All open cotton was badly damaged. The seed had sprouted in the burs to such an extent that it was difficult to find a sound seed in many of the varieties. This was especially true of all varieties having short stems which do not bend and invert the bolls, but the Triumph cotton, owing to its long, slender stems, was not damaged nearly so much.

FIG. 7.—Mature boll of Triumph cotton.

Mr. Mebane's entire crop for several years has given an average of over 38 per cent of lint, with occasional loads yielding 39 per cent or more; in other words, it takes only about 1,300 pounds of seed cotton to make a 500-pound bale of lint. The original cotton from which this variety was developed yielded only 34 to 35 per cent of lint. The staple is of good quality, averaging from 1 inch to $1\frac{1}{8}$ inches in length and in some plants reaching $1\frac{1}{4}$ inches, and it generally ranks a little better than the ordinary big-boll Stormproof cotton and brings a somewhat higher price.

While not to be classed as an early variety, the plant sets its form in good season and matures the bolls so early that a large proportion escapes injury from the boll weevil and produces a crop. Mr. Mebane has averaged about one-half a bale per acre for his entire plantation, although for several years past it has been badly infested with the boll weevil.

This variety originated on black waxy land, and is especially well

adapted to that soil. It is rapidly gaining favor in the part of the State where it originated and should be more widely distributed.

Plant strong and thrifty, beginning to fruit near the ground, close to the stalk, of stormproof type; limbs short jointed; bolls pendulous when mature, large, ovate, blunt pointed, 5 locked, opening wide and easy to pick; seeds medium in size, mainly fuzzy or tufted, with some smooth and black like Peterkin, well covered; lint white, 1 inch to 1¼ inches long and of good quality; per cent of lint 37 to 39; season of maturing medium early.

The seed of this variety which is being distributed this season was secured from several sources. A portion was purchased from Mr. Sam. Montgomery, of Greenville, Miss. This seed will be distributed in sections which are not infested by boll weevils, and where this variety has not been introduced heretofore. Seed of this variety was also purchased from Messrs. A. D. Mebane, Lockhart, Tex., John Holmes, Waco, Tex., and D. M. Crenshaw, Waco, Tex. The seed procured from these gentlemen is from a highly select strain, grown under the direction of the Cotton Laboratory of the Plant Breeding Investigations of the Bureau of Plant Industry, and will be distributed only in the boll-weevil districts.

CORLEY.

(Distribution arranged by H. J. Webber.)

The Corley, or Corley's Wonderful, cotton was produced by the selection of a single superior stalk by Mr. W. A. Corley, at Kellyton, Ala. It is a big-boll, vigorous-growing variety, and is claimed by the originator to give a specially high proportion of lint, averaging about 38 per cent. It is also said to stand drought exceptionally well and to be very resistant to storms and disease. The lint is claimed to average from $1\frac{3}{16}$ to 1¼ inches in length. The variety has not been tested in the experiments of the Bureau of Plant Industry, but it is believed to be an excellent sort.

The seed distributed by the Department of Agriculture was grown by Mr. W. A. Corley, the originator of the variety, at Kellyton, Ala., in 1906.

Long-Staple Upland Varieties.

COLUMBIA.

(Distribution arranged by H. J. Webber.)

In the course of the cotton-breeding experiments which have been conducted by the writer for the Department of Agriculture, special attention has been given to producing new and improved long-staple Upland varieties. One strain which has been under very careful selection for five consecutive generations at Columbia, S. C., has

shown very marked improvement and has been named the Columbia (fig. 8).

The following is a short statement of the methods used in producing the variety. In the summer of 1902 a plat of Russell Big-Boll cotton was grown in connection with the writer's experiments for the purpose of testing the variety in comparison with other sorts and making selections. Every plant in the plat was carefully examined and the lint combed to determine its length. The length of lint was found to be somewhat variable, in general being from 1 inch to $1\frac{1}{8}$ inches. About half a dozen plants were found with lint nearly $1\frac{1}{4}$ inches long, and one particularly good plant had lint averaging about $1\frac{3}{8}$ inches in length.

FIG. 8.—Mature boll of Columbia cotton.

Several of the best plants that had long lint were planted in 1903 by the plant-to-row method. An examination of the rows when the plants matured brought out the fact that the one plant selected in 1902 that had lint $1\frac{3}{8}$ inches long had reproduced its character in marked degree, while the rows planted from the seed of the other plants were only slightly better than the ordinary Russell cotton. The selections made in 1903 were therefore all taken from the progeny of this one superior plant. About 75 per cent of these plants produced lint $1\frac{1}{4}$ inches in length and about twelve plants gave lint nearly $1\frac{3}{8}$ inches long. Seed was preserved only from the twelve best plants, and these were planted in an isolated plat in 1904 by the plant-to-row method. In 1904 several of the rows of plants were much below the standard set and only one of the rows was considered superior. All of the selections in this season were made from this superior progeny. In 1905 an isolated patch of about $1\frac{1}{2}$ acres was planted again by the plant-to-row method. In this season the variety had been reduced to practical fixity of type, and the breeding patch was exceptionally fine and fairly uniform. In 1905 some individual selections were made, after which a con-

siderable number of good second select plants were marked and saved for seed to plant a multiplication patch in 1906.

In 1906 a multiplication patch of 14 acres was planted with the second select seed, and it is the seed from this multiplication patch which is being distributed the present season. The 14-acre patch produced 25,500 pounds of seed cotton and 7,395 pounds of lint, or 1,821 pounds of seed cotton and 528 pounds of lint to the acre. The lint sold on the Columbia market early in the season at 13 cents a pound. Had it been sold in a long-staple market later in the season it would have brought a much higher price.

Throughout the selection the aim has been to select plants having the Russell type of branching and boll, so that the plant of the Columbia is scarcely recognizable as distinct from the Russell. The very large boll has also been retained and the variety is in every respect of true Upland type aside from its lint character.

The true Russell variety produces a large seed covered with dark-green fuzz. This character is very undesirable, owing to the discoloration of the lint if ginned while somewhat wet, by the pulling off of the green fuzz, and also owing to the green color giving undesirable linters. In the selection, therefore, special attention has been given to selecting a white seed. The great majority of the plants of the Columbia now produce white seed, but this character has not as yet been entirely fixed.

While the variety is now probably one of the best long-staple Upland sorts, it requires to be further improved in some characters. As will be seen from an examination of the yields of the 14-acre patch, the lint turnout was only 29 per cent. In increasing the length of lint there has been a slight loss in the percentage of lint. The Russell variety, however, seldom averages more than from 30 to 31 per cent, owing to its very large seed. Practically speaking, this can not be considered a serious drawback to the variety if the yield of lint per acre holds up, and it is believed that the yield of lint per acre will average as high as that of ordinary short-staple sorts grown under the same conditions.

In the selection of the variety up to the present time little attention has been given to increasing the percentage of lint. In the selections made in 1906, however, this feature was made one of the important points. It was found that the different selections varied in percentage of lint from 29 to 34½. All of the selections from one row of plants averaged from 32 to 34 per cent. It is therefore certain that the variety can be easily and greatly improved in this character.

The writer has had considerable experience with the long-staple Upland cotton, having grown and tested practically all of the known varieties. Considering all characters, he believes the Columbia to be one of the most promising varieties of this class of cotton. He

would strongly recommend growers to give this cotton a thorough trial for several years, being careful to select the seed for planting in accordance with the method suggested later on in this paper.

Following is a short technical description of this variety:

Plant low, compact, of Russell type, having several long branching basal limbs, vigorous and prolific; bolls large to very large, ovate, blunt pointed, opening very wide, mainly 5 locked; seeds large, fuzzy, white or greenish, 8 to 10 per lock; lint very strong, from $1\frac{7}{16}$ to $1\frac{3}{8}$ inches in length, fine, silky, and very uniform in length; seeds only moderately well covered, giving from 29 to 30 per cent of lint; season of maturing medium.

The field of Columbia cotton from which the seed distributed was taken was grown by Col. D. J. Griffith, superintendent of the State penitentiary at Columbia, S. C., under the direction of the Department of Agriculture.

SOUTHERN HOPE.

(Distribution arranged by H. J. Webber.)

The variety known as Southern Hope (fig. 9) is stated by Prof. S. M. Tracy to have been originated by Col. F. Robieu, of Louisiana, from seed said to have come from Peru. It is one of the old varieties, but after being in cultivation for a quarter of a century still remains a favorite in some sections, and has been preserved nearly pure by a number of cultivators.

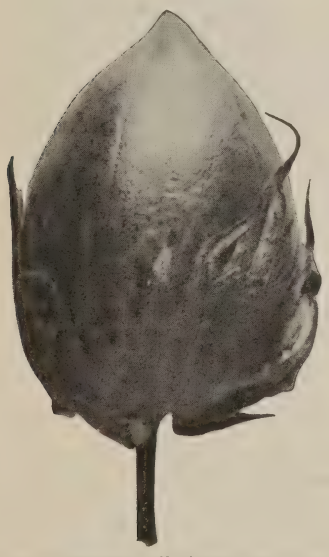

FIG. 9.—Mature boll of Southern Hope cotton.

There is a growing opinion that cottons of a better staple than those ordinarily grown should be more extensively cultivated. In some sections a prejudice exists against the growing of varieties of long-staple cotton, but this is mainly directed against the varieties with a staple of from $1\frac{1}{2}$ to $1\frac{5}{8}$ inches in length. The varieties of medium long staple, like the Southern Hope, yield nearly or quite as heavily as the ordinary Uplands and always sell at a considerable premium over the short-staple cottons. This variety has for the last three years been carefully bred in the experiments of the Bureau of Plant Industry by systematic pedigree methods to increase the yield and improve the lint. The limited quantity of seed distributed is from the breeding patch and should, therefore, be of particularly good quality. The variety is an excellent early sort, producing fine lint.

Plant pyramidal, spreading, open, rather long jointed; bolls 4 and 5 locked, medium size, ovate, blunt pointed, opening well and easy to pick; seeds medium size, white, fuzzy or tufted; lint white, averaging 1¼ inches in length, fine, and fairly strong; per cent of lint to seed cotton 30 to 32; season of maturing medium.

The seed distributed by the Department of Agriculture this season (1907) was taken from a field planted with carefully selected seed at Columbia, S. C., in 1906.

SUNFLOWER.

(Distribution arranged by E. B. Boykin.)

The Sunflower variety (fig. 10) is of unknown parentage, being the offspring of seeds shipped to an oil mill in Yazoo City, Miss., in 1900, which were purchased for planting by Mr. Marx Schaefer. The field in which the seed were planted soon attracted attention by the vigorous growth of the plants, and when the crop began to mature it was readily seen that it was of very superior quality. Selections of seed from the best shaped and most prolific plants were made that season, and the same method of selection has been followed for each succeeding crop, with the result of making the plants more uniform in shape and more prolific. The yield has been from 300 to 500 pounds of lint per acre, fully equal to the yields of short-staple varieties grown during the same seasons on the same plantation. The crops sold in Yazoo City during the past four years have brought from 14½ to 15½ cents per pound, and no other cotton sold in the same market has brought a higher price.

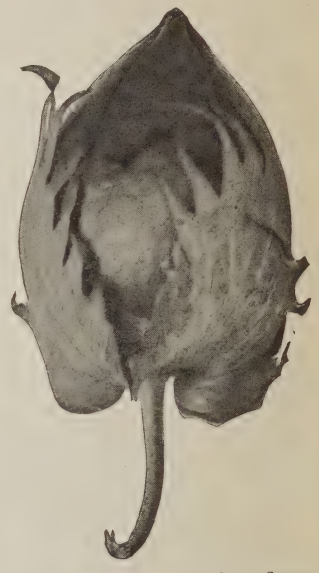

FIG. 10.—Mature boll of Sunflower cotton.

The writer grew a small plat of Sunflower cotton in the same season of 1903 at Columbia, S. C., in comparison with plats of the well-known varieties of long-staple Uplands. While from the history of the origin of the variety it would probably be supposed to be the same as some well-known sort, it proved to be very distinct in general appearance, form of branching, earliness, and productiveness.

The selections made by Mr. Schaefer may have materially modified the characters of the variety. However this may be, it is certainly distinct from any sort known to the writer, being about ten days earlier than Allen Improved, Griffin, or any of the other varieties of

long-staple Upland cottons tested in comparison with it. It was nearly as early as a plat of King planted near it, but continued to set and mature bolls much later than that variety. Its earliness and productiveness indicate that it will be found to be a good variety for general cultivation.

Plant vigorous, medium in size, sugar loaf in form, similar to Peterkin, and very prolific; bolls 4 to 5 locked, medium size, ovate, blunt pointed, opening well, but not dropping the seed cotton; seeds medium in size, covered with white fuzz, 8 to 9 per lock; lint fine and strong, white, 1⅜ to 1½ inches in length, 28 to 30 per cent of the seed cotton; season early.

The field from which the seed distributed was taken was planted with carefully picked seed from selected individual plants, the selections being made by an agent of the Department of Agriculture at Bishopville, S. C., in 1905. The plants were grown for the Department by Mr. J. Q. Eaton, at Itta Bena, Miss., in the season of 1906.

METHODS OF CULTIVATION AND GINNING.

SHORT-STAPLE UPLAND VARIETIES.

The methods of cultivation which should be pursued in growing the varieties of short-staple Upland cotton distributed are the same as those used for any ordinary Upland cotton. No exact directions can be given with respect to the distance apart of the rows or the distance between the plants in the row, as the space required by each plant is determined by the fertility of the soil in each case. The varieties distributed are all quite similar in size and habit of the plant. Under ordinary conditions satisfactory results would be obtained with them by planting the rows 4 feet apart and the plants from 18 to 24 inches apart in the row. On rich soil this distance should be somewhat increased, while on sterile land closer planting is desirable.

LONG-STAPLE UPLAND VARIETIES.

These varieties of long-staple Upland cotton, while producing a medium long, fine staple, are in size and general appearance of plant very similar to ordinary short-staple varieties, and the same cultural methods are to be recommended as are used with the ordinary short-staple sorts. In picking, handling, and ginning, however, more care is required if the highest market price is to be realized. Greater care should be exercised in picking to avoid getting the fiber mixed with fragments of leaves, bolls, and twigs. Fiber from immature and weather-stained bolls should also be rejected. Pickers accustomed to picking ordinary cotton are likely to be careless in picking long-staple cotton, owing to their endeavor to gather large quantities and in-

crease their wages. In fine grades of long-staple Upland cotton it would probably also be found desirable before storing it to spread the seed cotton on a platform in the sun for a few hours to dry.

The difficulty experienced in properly ginning long-staple Upland cottons has been considered an obstacle to their general cultivation. It is generally recognized that long-staple Sea Island sorts should be ginned on a roller gin, as the saw gins tear and break the fiber to such an extent as to greatly reduce its value. It is also very generally supposed that the long-staple Upland cottons should be ginned on a roller gin, and this understanding has prevented many from attempting to grow these cottons, as roller gins are ordinarily only accessible to growers in regions where Sea Island cotton is cultivated. Experience has shown, however, that the long-staple Upland cottons may be ginned on ordinary saw gins if care is used in the process. Before ginning these cottons the gin saws should be sharpened square across the teeth and then dulled somewhat by use in ginning ordinary short-staple cotton. It is also important to run the gin at a lower rate of speed than in ginning ordinary short-staple cottons, 300 revolutions per minute being usually recommended. If these precautions are observed the long-staple Upland cottons may be very satisfactorily ginned on an ordinary saw gin.

It is also important that growers of long-staple Upland cottons give special attention to the marketing of the product. In 1902 the writer saw several bales of long-staple Upland cotton sold to a buyer at a small interior town in South Carolina for 10 cents a pound, which were certainly equal to bales of similar cotton which he saw sold in the New Orleans market the week following at 15 cents, when ordinary cotton was selling at $8\frac{1}{4}$ cents.

Many of the failures with long-staple Upland cotton have been due to the lack of experience on the part of the grower in the matter of marketing. Some buyers take advantage of the grower's ignorance, purchasing cotton for 10 cents that is worth 15 cents a pound and realizing the difference themselves. Until buyers inform themselves on the value of long-staple cotton and pay reasonable prices, it will have to be consigned to general long-staple markets, such as New Orleans, Memphis, or Vicksburg, or to some of the large New England markets, such as Providence or Boston.

The demand for long-staple Upland cotton is rapidly increasing, and doubtless the area cultivated in this type of cotton will be very greatly increased in a few years. Good grades, with a staple averaging about $1\frac{1}{2}$ inches, sold the present season as high as 21 and 22 cents a pound, which is as much as is commonly paid for ordinary grades of Sea Island cotton.

HOW TO GROW PURE SEED OF GOOD QUALITY.

It is a well-known fact that varieties of cotton become mixed and impure unless special care is taken to prevent crossing with other varieties. If growers receiving seed of any of the varieties sent with this circular desire to grow the same sort another year, precaution should be taken to plant the seed in an isolated patch, situated as far from any other varieties as possible. It should be at least one-fourth of a mile from any other cotton and preferably in a field surrounded by a forest, particularly on the side nearest to other cotton fields. Before any seed is gathered for planting, all plants which are not true to the type of the variety should be carefully weeded out.

If it be desired to keep the variety up to its full productiveness and better adapt it to local conditions, this may be easily accomplished by following a simple and inexpensive method of selection. Before beginning the picking, go over the patch carefully and select and mark with a white cloth the best plants—the most productive, earliest in ripening, and those having the largest, best formed, and most numerous bolls. Care should be exercised to select plants that are true to the type of the variety. Before each picking, except the last, send a careful man over the patch to pick the seed from the selected plants. Preserve and gin this seed separately to avoid mixing, and use it to plant the crop the following year.

If this simple method of selection is carried out each year, the yield will doubtless be increased and much more added to the crop than would result from special fertilization or cultivation, though these factors should by no means be neglected. The importance of careful seed selection is seldom fully recognized, and growers are urged to give this factor of cotton culture more careful attention.

REPORT OF RESULTS DESIRED FOR PUBLICATION.

In order to determine the comparative value of the different varieties of cotton in various cotton-growing regions, the growers receiving this seed are requested to give it a thorough trial in comparison with the variety or varieties that they ordinarily grow, and be prepared in the autumn of 1907 to report the results of the test to the United States Department of Agriculture. A report will then be requested covering the following points:

(1) Character of the soil.
(2) Character of the season.
(3) Total yield of seed-cotton produced. (Determined by actual weighing.)
(4) Total yield of lint produced. (Determined by actual weighing.)
(5) Size of patch grown. (Determined by actual measurement.)

(6) Yield per acre. (Estimated from the patch grown.)

(7) Rating of the variety for your section—whether excellent, good, fair, or poor.

(8) Name of the variety ordinarily grown by the planter making the test.

(9) Yield of ordinary variety this year on same soil as the variety under consideration.

It is especially requested that growers carefully note the points enumerated above in order that they may secure the necessary data and be ready to supply accurate information when it is called for next autumn. If sufficiently accurate data are furnished, a report will be compiled and issued giving the results of the various trials in all sections, and this report will be sent to all planters cooperating in the experiment. In this way it is hoped to obtain valuable and reliable information regarding the varieties best adapted to various sections of the cotton belt.

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